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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,412	12/08/2003	Mark A. Ealey	XIN-101J	2452
7590		12/29/2005	EXAMINER	
Iandiorio & Teska		SHAHER, RICKY D		
260 Bear Hill Road		ART UNIT		
Waltham, MA 02451-1018		PAPER NUMBER		
		2872		

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/730,412	<b>Applicant(s)</b> EALEY, MARK A.	
	<b>Examiner</b> Ricky D. Shafer	<b>Art Unit</b> 2872	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is vague and indefinite due to the fact the claim is not organized and correlated in such a manner as to present a complete operative device. It is unclear the examiner how the plurality of actuators can possibly alter the shape of the mirror surface, when the actuators are not even physically connected the mirror surface.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawicki ('379).

To the extent the claims are definite, Sawicki discloses actuator mirror comprising an optical substrate (12) including a mirror surface (13) on one side and a support structure having an array of spaced posts [(14),(16),(18), (20),(22),(24),(26),(28)] on the other side and a plurality of actuators [(42),(44),(46),(48)] embedded (to make an integral part of) in said support structure spaced from and generally parallel to said mirror surface for applying bending moments to said

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mirror surface for controllably altering the shape of said mirror surface. Note figures 1 and 3 to 7 along with the associated description thereof.

5. Claims 1-3, 5, 7, 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Dongi et al ('519).

To the extent the claims are definite, Dongi et al discloses an actuator mirror comprising a glass optical substrate (7) including a mirror surface (8) on one side and a support structure (3-6) on the other; and a plurality of actuators (5) for controllably altering the shape of said mirror surface, wherein said actuators are embedded (to make an integral part of) in said support and comprises top and bottom surfaces which are generally parallel to the mirror surface for apply bending moments to said mirror surface and wherein said support includes an array of intersecting ribs and posts (3) and cathedral ribs (6). Note figures 1 to 5 along with the associated description thereof.

6. Claims 1, 2, 5-9, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuschetto ('507).

To the extent the claims are definite, Fuschetto discloses actuator mirror comprising an optical substrate (11) including a mirror surface on one side and a support structure (19,23) having an array of intersecting ribs/posts [(13a), (13b), (15a),(15b),(17a),(17b)] on the other side and a plurality of electrostrictive actuators [(13),(15),(17)] embedded (to make an integral part of) in said support structure spaced from and generally parallel to said mirror surface for applying bending moments to said mirror surface for controllably altering the shape of said mirror surface. Note figures 1 to 6 along with the associated description thereof.

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawicki ('379), Dongi et al ('519) or Fuschetto ('507) in view of Shuskus et al ('467).

Sawicki, Dongi et al and Fuschetto each disclose all of the subject matter claimed, note the above explanation, except for the optical substrate being of silicon carbide.

Shuskus et al teaches it is well known to use silicon carbide in the same field of endeavor for the purpose of it's thermal stability characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the optical substrate of Sawicki, Dongi et al or Fuschetto to include silicon carbide, as taught by Shuskus et al, in order to increase the mirror's thermal stability to environmental changes.

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dongi et al ('519) or Fuschetto ('507) in view of Alden et al ('654).

Dongi et al and Fuschetto each disclose all of the subject matter claimed, note the above explanation, except for the actuators being of lead magnesium niobate.

Alden et al teaches it is well known to use a lead magnesium niobate material as actuators in the same field of endeavor for the purpose of controlling small changes in the shape of a mirror surface with greater precision.

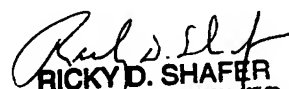
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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the actuators of Dongi et al or Fuschetto to include a lead magnesium niobate material, as taught by Alden et al, in order to increase the mirror's stability by providing a greater control to the shape of the mirror's reflecting surface.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ricky D. Shafer whose telephone number is (571) 272-2320. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RDS

December 27, 2005



RICKY D. SHAFFER  
PATENT EXAMINER  
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